DETAILED ACTION

1. Applicant's amendment filed 20 November 2008 has been entered.

Status of the Claims

Claims 1-6, 10-12, 33-34 and 94-127 are pending.

Claims 7-9, 13-32 and 35-93 have been canceled.

Claims 123-127 are withdrawn as being directed to a non-elected invention.

Claims 1-6, 10-12, 33-34 and 94-122 are under consideration.

Election/Restrictions

1. Newly submitted claims 123-127 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Newly added claims 121-127 require nanoparticles having an attached probe configured to bind a predetermined analyte within the gel, which is not required of the previously examined claims. The previously examined claims require nanoparticles stationary within the gel, which is not required of new claims 123-127.

2. Restriction for examination purposes as indicated is proper because all the inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

(a) the inventions have acquired a separate status in the art in view of their different classification;

(b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

(d) the prior art applicable to one invention would not likely be applicable to another invention;

(e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention**.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 123-127 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1-6, 10-12, 33, 34, 94-122 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment to claims 1, 33 and 95 recites a “gel matrix thick enough to perform electrophoresis” and

the amendment to claim 96 recites a "gel matrix thick enough to perform magnetophoresis", which is not provided for in the instant specification and is new matter. It is noted that instant specification, at paragraph 35, describes a gel that is used for electrophoresis and the specification also describes a gel that is used for magnetophoresis or electrophoresis, but does not teach any required thickness of the gel for performing electrophoresis. The specification does not define a thickness that is sufficient to perform electrophoresis or magnetophoresis. The specification fails to provide support for a gel matrix that has a sufficient thickness to perform electrophoresis or magnetophoresis as recited in claims 1, 33, 95 and 96.

. *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1, 2, 5, 10, 33, 94-97, 100, 102, 105, 108, 110, 113, 116 and 118 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US 6,699,724) in view of Renn et al. (US 3,875,044).

West et al. teach a gel matrix comprising an alginate gel (alginate, col. 3, lines 48-52; col. 14, lines 49-53) comprising pores having a size to sieve molecules of a desired range (sample with molecules to be detected are incubated in the gel with the nanoparticles, therefore the hydrogel matrix must have a pore size large enough to permit movement of molecules, col. 15, lines 6-11; col. 16, lines 20-24) and one or more SERS-enhancing nanoparticles (core diameters start at 1nm and shell thickness starts at 1nm, which means the particle size starts at 3nm, col. 8, lines 23-26; nanoparticles are SERS-enhancing, col. 8, lines 3, lines 63-66; col. 10, lines 64-66) stationary within the gel (nanoshells are embedded to prevent migration, col. 12, lines 56-59).

West differs from the instant claims in failing to teach the alginate gel capable of moving the molecules by electrophoresis.

Renn et al. teach that a hydrated gel of alginate, agarose or polyacrylamide gel may be used for electrophoresis, in order to provide a hydrated gel sheet for molecular diffusion processes.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include as the gel of West et al., an agarose or polyacrylamide gel as taught by Renn et al. One having ordinary skill in the art would have been motivated to make such a change as a mere alternative and functionally equivalent hydrogel and since the same gelling and matrix support effect would have

been obtained. The use of alternative and functionally equivalent techniques would have been desirable to those of ordinary skill in the art based on the economics and availability of components. Although West et al. and Renn et al. do not specifically address the method of magnetophoresis, according to the instant specification at paragraph 35, indicates that electorphoresis and magnetophoresis may be performed within the same gel material. Therefore, since the gel material taught by Renn et al. is the same taught in the instant specification, the gel of Renn et al. would also be a magnetophoresis gel and capable of performing magnetophoresis.

With respect to claims 2, 5, 97, 100, 105, 108, 113 and 116, West et al. teach a plurality of nanoparticles to provide a plurality of unique optical signatures (different signals are detected to differentiate between analyte, col. 12, lines 21-28; different signals are controlled by shell thickness, col. 3, lines 18-27).

Regarding claims 10, 94, 102, 110 and 118, West et al. teach a probe attached to the nanoparticles being oligonucleotides, antigens or antibodies (col. 3, lines 51-57) that bind specifically to an analyte (col. 4, lines 42-45).

With respect to claim 33, West et al. teach a system comprising the gel matrix of claim 1, a sample containing at least one analyte (col. 4, lines 64-67); and an optical detection system suitable for detecting SERS signals from the nanoparticles (col. 7, lines 2-6).

2. Claims 3, 4, 11, 12, 34, 98, 99, 103, 104, 106, 107, 111, 112, 114, 115, 119 and 120 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US

6,699,724) in view of Renn et al. (US 3,875,044), as applied to claim 1, further in view of Schultz et al. (US 6,180,415).

West et al. in view of Renn et al. teach a gel matrix comprising embedded SERS-enhancing nanoparticles, but fail to teach the nanoparticles having Raman-active tags or the nanoparticles having a net charge.

Schultz et al. teach SERS-enhancing nanoparticles comprising one or more Raman active tags of fluorescent dyes and nucleic acids (col. 3, lines 42-48), at least one of the nanoparticles having a net charge (col. 30, lines 55-57) and a computer comprising an algorithm for analysis of the SERS signals obtained from the sample (col. 15, line 66-col. 16, line 4), in order to provide a Raman signal with increased enhancement.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include on the nanoparticles in the matrix of West et al. in view of Renn et al., Raman active tags as taught by Schultz et al., in order to provide a Raman signal with improved sensitivity and more accurately detect the presence of analyte.

Regarding claims 11, 12, 103, 104, 111, 112, 119 and 120, Schultz et al. teach at least some of the nanoparticles comprising a fluorescent label that contributes to the optical signature (col. 23, lines 40-48). The properties of the nanoparticles taught by Schultz et al. are provided for increased Raman signal enhancement.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the gel matrix of West et al. in view of Renn et

al., nanoparticle properties described above as taught by Schultz et al., in order to provide a Raman signal with improved sensitivity and more accurately detects the presence of analyte.

3. Claims 6, 101, 109, 117, 121 and 122 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US 6,699,724) in view of Renn et al. (US 3,875,044), as applied to claim 1, further in view of Mirkin et al. (US 2003/0211488).

West et al. in view of Renn et al. teach a gel matrix comprising nanoparticles, but fail to teach the Raman tag comprising adenine and a plurality of nanoparticles comprising a unique optically active polynucleotide barcode.

Mirkin et al. teach a Raman-active tag being an analog of adenine, poly-adenine (par. 181) and the particles contributing to a unique optically active barcode (par. 115 and 191), in order to utilize a spectroscopic fingerprint in protein-protein screening.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the solid gel matrix of West et al. in view of Renn et al., nanoparticles comprising a Raman-active tag of an analog of adenine and the plurality of nanoparticles forming a unique optically active barcode as taught by Mirkin et al., in order to provide increased sensitivity and specificity of detection of analyte and to provide massively parallel labeling abilities.

Response to Arguments

4. Applicant's arguments filed 20 November 2008 have been fully considered but they are not persuasive.

5. Regarding the new matter rejection under 35 USC 112, first paragraph, applicant argues that *ipsis verbis* support is not necessary and description of a gel matrix thick enough to perform electrophoresis is found throughout the application because the application describes a gel that performs electrophoresis. Applicant's argument is not persuasive because such a description is not sufficient for teaching a gel thickness. Nowhere in the application is a thickness of the gel mentioned or described and therefore provides no guidance as to what thickness for performing electrophoresis would be appropriate. Therefore the instant specification does not provide sufficient support to claim a specific thickness of the gel.

6. Regarding the art rejections under 35 USC 103(a), applicant argues that electrophoresis layers are typically between 1 and 2 mm, while the support layer of West is only 2-100 microns. Applicant cites four references that teach electrophoresis layers between 0.4 and 1.5 mm and argues that the gel taught by West is not thick enough to perform electrophoresis. Applicant's argument is not persuasive because the prior art teaches that thin gels may be used for electrophoresis. Chait et al. (US 4,443,319) teach a thin electrophoresis gel having a thickness between 50 and 500 microns (col. 3, lines 30-38), which partially encompasses the thickness of 2-100 microns taught by West et al. Place et al. (US 4,652,354) teach a thin electrophoresis gel having a thickness that is as thin as possible between 20 and 500 microns (col. 2, lines 14-27), which partially encompasses the thickness of 2-100 microns taught by West et al. Therefore according to the prior art, at least part of the range of gel

thickness of 2-100 microns taught by West et al. has a thickness that is capable performing electrophoresis.

Conclusion

7. No claims are allowed.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELANIE YU whose telephone number is (571)272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on (571) 272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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